

Mobile, Alabama, 19th.—A cotton house and residence was struck by lightning and set on fire during thunder-storm of this date.

New Orleans, Louisiana, 19th.—Several buildings and trees were struck by lightning during the thunder-storm of this date; in one instance a house was set on fire and damaged to a considerable extent. The top-gallant-mast of the bark "Unga" was shattered by lightning.

Buffalo, Texas, 19th.—A house was struck by lightning on this date, and six of the inmates were severely shocked.

Fort Scott, Kansas, 12th.—During thunder-storm, a barn near this place was struck by lightning and burned, together with a large amount of hay and grain, and some live-stock.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts, on the following dates:—

New England.—4th, 9th, 11th, 12th, 13th, 16th, 18th, 19th.

Middle Atlantic states.—3d, 4th, 10th, 11th, 12th, 18th, 24th, 25th, 31st.

South Atlantic states.—2d, 3d, 8th, 13th, 15th, 18th, 28th, 29th.

Ohio valley and Tennessee.—9th, 12th, 14th, 15th, 16th, 18th, 21st, 22d, 30th, 31st.

Lower lakes.—4th, 10th, 11th, 15th, 24th, 26th, 30th.

Upper lakes.—1st, 4th, 8th, 9th, 10th, 14th, 16th, 18th, 22d, 23d.

Extreme northwest.—2d, 3d, 4th, 6th, 10th, 13th, 17th, 25th, 26th.

Upper Mississippi valley.—1st, 2d, 3d, 7th to 15th, 18th to 22d, 25th, 27th, 30th, 31st.

Missouri valley.—1st, 2d, 5th, 6th, 8th, 9th, 12th, 13th, 14th, 17th, 19th, 22d, 30th.

California.—11th, 13th, 14th, 18th, 25th, 26th, 28th.

Solar halos were also reported from the following stations, not included in the districts named above:—

Key West, Florida, 2d, 16th; Palestine, Texas, 11th, 14th, 17th, 18th, 28th to 30th; Fort Keogh, Montana, 14th, 21st, 28th; Creswell, Kansas, 2d, 19th; Salina, Kansas, 20th; Yates Centre, Kansas, 11th, 31st; Santa Fé, New Mexico, 20th.

Mr. Henry White, at Fargo, Dakota, reports interesting halos and parhelia, observed by him at that point on the morning of the 13th of January (the hour is not specified). A horizontal band of light extended through the sun, indefinitely to the right and left, and a vertical band extended to an altitude of apparently 45°; circular halos surrounded the sun, the inner one apparently having the ordinary angular radius of 22½°, and beyond this, one of 45°; a fragmentary arc parallel to these circles existed in the upper portion of the space between them; at the intersection of the circles and horizontal band, parhelia were observed. Excepting the presence of the vertical band and fragmentary arc, this system of halos and parhelia was as is represented in paragraph 428, Loomis's Meteorology.

LUNAR HALOS.

Lunar halos have been observed in the various districts, on the following dates:—

New England.—1st, 15th, 18th, 25th, 26th, 27th.

Middle Atlantic states.—4th, 11th, 13th to 16th, 18th, 21st to 24th, 31st.

South Atlantic states.—13th, 15th, 17th to 20th, 25th.

Eastern Gulf.—1st, 3d, 11th, 17th, 20th, 21st, 31st.

Western Gulf.—2d, 14th, 16th to 21st, 31st.

Ohio valley and Tennessee.—11th, 12th, 14th to 26th, 30th.

Lower lakes.—11th, 15th, 16th, 19th, 21st, 23d.

Upper lakes.—1st, 13th to 19th, 22d to 26th, 29th.

Extreme northwest.—14th, 17th, 18th, 20th, 21st, 23d, 25th.

Upper Mississippi valley.—1st, 13th, 14th, 17th to 22d, 24th, 25th, 26th, 31st.

Missouri valley.—13th, 14th, 17th to 20th, 22d to 25th, 27th, 28th.

Northern slope.—13th to 21st, 24th, 25th.

Southern slope.—11th, 19th, 20th, 31st.

Southern plateau.—2d, 4th, 11th, 13th, 14th, 27th.

California.—3d, 22d, 24th, 25th, 26th, 30th.

Lunar halos were also reported from the following stations, not included in the districts named above:—

Cedar Keys, Florida, 16th, 17th; Eagle Pass, Texas, 17th, 18th, 20th, 24th, 28th; Pike's Peak, Colorado, 20th; Yates Centre, Kansas, 22d; Salt Lake City, Utah, 21st; Pioche, Nevada, 1st, 13th, 14th; Umatilla, Oregon, 12th; Roseburg, Oregon, 21st.

MIRAGE.

Wicklow, Dakota, 1st.—At sunrise the horizon between the sw., and wsw., appeared from ten to fifteen feet higher than its natural position.

Pretty Prairie, Kansas, 21st.

Genoa, Nebraska, 24th, 27th, 28th, 29th.

Indianola, Texas, 7th, 9th, 14th, 16th, 22d, 23d.

Portsmouth, North Carolina, 17th.—Captain Fisher of the schooner "Sophia Hanson," which went ashore near Ocracoke on the 16th, states that the disaster was due in part to the effects of mirage.

MISCELLANEOUS PHENOMENA.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and sixty-nine stations show 5,176 observations to have been made, of which twenty-one were reported doubtful; of the remainder, 5,155, there were 4,341, or 84.2 per cent., followed by the expected weather.

SUN SPOTS.

The following record of sun spots for the month of January, 1883, has been forwarded by Mr. D. P. Todd, Director of the Lawrence Observatory, Amherst, Massachusetts:—

DATE— Jan., 1883.	No. of new		Disappear'd by solar rotation.		Reappear'd by solar rotation.		Total No. visible.		REMARKS.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
8, 12 m.							2	7	
11, 12 m.	1	6			1	6	1	6	
12, 12 m.	1	5	0	0	1	5	2	12†	
14, 1 p.	2	8†	0	0	0	0	4	20†	
15, 3 p.	1	10†	0	0	1	5	5	30†	
18, 11 a. m.	0	0	1	2	0	0	3	25†	
22, 11 a. m.	1	3			1	3	5	20†	
23, 9 a. m.	1	1	0	5	1	1	6	15†	Spots mostly small.
24, 9 a. m.	0	0	2	5	0	0	6	10†	Do.
26, 12 m.	0	0	1	2	0	0	3	8	Do.
30, 10 a. m.	1	1					3	6	

†Approximated. Faculae were seen at the time of every observation.

Wicklow, Dakota, 15.—At 4.15 p. m. a large oblong spot was observed on the sun's disc near the centre, with a group of spots toward the northwestern quadrant; a smaller spot was also observed about midway between the centre and upper edge.

North Lewisburg, Ohio.—Mr. H. D. Gowy reports: Sun spots were seen on all clear days during the month; they were most numerous on the 2d; least numerous on the 11th; largest on the 18th, and smallest at the close of the month.

METEORS.

A remarkably brilliant meteoric display occurred on the night of January 3d. The phenomenon was observed at stations in Wisconsin, Michigan, Missouri, Iowa, Illinois, Indiana and Ohio, and is generally described as having resembled a large, bright ball of fire. The following reports in connection therewith are of interest:—

Ohio.—Cincinnati: At about 7.00 p. m., 3d, a meteor of unusual size and brilliancy passed in a southwesterly direction from a point slightly east of north. The meteor was apparently as large as a man's head and resembled a ball of fire surrounded by a halo of light, which, in turn was surmounted by a circle of greenish color.

North Lewisburg, Champaign county: at 7.15 p. m., 3d, a meteor, resembling a small white star was observed to pass

from north to south at an elevation of 40° , and disappeared at that elevation. It left a trail resembling the tail of a comet; the train was from 1° to 3° in width and about 20° in length, and was visible for twenty minutes; before disappearing it assumed a serpentine shape.

Indiana.—Logansport, Cass county: At 7.05 p. m., 3d, a brilliant meteor passed over the city from east to west. It moved with a hissing noise like that of a rocket, and apparently exploded near the horizon, leaving a yellowish light in its trail.

Vevay, Switzerland county: At 6.55 p. m., 3d, a meteor of intense brilliancy passed over this place; its color was of a bluish tint, resembling the electric light. Its path was due southwestward, followed by a brilliant train whose luminous path was visible for ten seconds. The nucleus had the appearance of Venus, when about 10° above the horizon.

Monticello, White county: 3d, during the evening, a brilliant meteor was observed; it started from a point about 45° above the southeastern horizon and moved westward, leaving a train of whitish light, which remained visible for several minutes.

The phenomenon was also reported from the following places by observers of the Indiana State Weather Service: Fort Wayne, Allen county; Wabash, Wabash county; Monticello, White county; Logansport, Cass county; Huntington, Huntington county; Kokomo, Howard county; Farmland, Randolph county; Indianapolis, Bloomington, Monroe county; and Vevay, Switzerland county.

Illinois.—Champaign, Champaign county: A very brilliant meteor was observed at about 6.40 p. m., 3d, at a point midway between the northeastern horizon and the zenith; during its passage across the sky, the whole heavens were lighted up for several seconds. The head of the meteor had the appearance of an electric light, and left a trail of a blood-red color. It is considered to have been the most brilliant meteor ever witnessed here.

Charleston, Coles county: At 6.45 p. m., 3d, a very brilliant meteor passed from east to west, leaving a long trail of various colors.

Riley, McHenry county: a meteor of unusual size and brilliancy passed across the heavens during the evening of the 3d.

Polo, Ogle county: At 6.50 p. m., 3d, a brilliant meteor was observed; it left a train which remained visible for one minute.

Clinton, DeWitt county: 3d, a meteor, resembling a ball of fire, passed from northeast to southwest over the city. It was apparently accompanied by a hissing sound, and left a crimson light in its wake.

Litchfield, Montgomery county: At 7.00 p. m., 3d, a large and brilliant meteor appeared in the northern sky; it moved from west to east and was of a vivid greenish-color. The meteor was also observed at Chicago; Morrison, Whitesides county, Hillsborough and Kokomis, Montgomery county.

Iowa.—Dubuque: At 6.48 p. m., 3d, a very brilliant meteor passed from east to west across the entire sky. It appeared to be about $30'$ in diameter and was of a bright yellow color.

Davenport: At 6.40 p. m., 3d, a very bright meteor was observed in the eastern sky, about 30° degrees above the horizon; it pursued a southwesterly course and disappeared in a bank of clouds near the horizon. The track of the meteor was marked by a line of red light which remained visible for about thirty seconds.

Muscatine, Muscatine county: at 6.45 p. m., 3d, a very brilliant meteor was observed.

Missouri.—Hanibal, Marion county: At 7.30 p. m., 3d, a brilliant meteor was observed just above the eastern horizon. It resembled a ball of fire of a bluish color and passed southeastward, being visible for several seconds. It was described as having a rotary or circular motion.

Michigan.—Port Huron: At 7.30 p. m., 3d, a brilliant meteor was observed in the southwestern sky.

Mr. L. P. Alden, at Coldwater, Branch county, reported: "At about 7 p. m., city time, on Wednesday, January 3d, a

brilliant meteor appeared almost directly in the south, about 35° above the horizon, and shot in a straight line towards the southwestern horizon, where it disappeared. The light seemed to be as brilliant as that of a two-pound rocket, and was composed of various colors, green predominating. It was in sight from fifteen to twenty seconds and increased in brilliancy until it seemed to burst just above the horizon. The most remarkable feature of this meteor was the trail of light which it left behind, the upper half of which remained very plainly visible for half an hour. At first, this track of light was perfectly straight, but after a few moments, it assumed a serpentine form, and, later, the two ends of the line folded together and slowly floated a little to the east, remaining at nearly the same altitude until it faded away."

Wisconsin.—Madison: At 6.45 p. m., 3d, a large meteor, resembling an electric light in brilliancy and color, and illuminating the entire heavens, was observed to shoot from a point about 45° above the southeastern horizon. It passed downward and disappeared at a point about 10° above the southwestern horizon; a dark-red light remained for several minutes at the starting point, this light at first elongated in the direction taken by the meteor and afterwards gradually faded to an irregular rounded form.

Milwaukee: At 7.00 p. m., 3d, a very large and brilliant meteor was observed. It was observed at West Bend.

Meteors of less brilliancy were reported by the following stations:—

Yuma, Arizona, 5th, 12th, 28th.

Visalia, California, 7th.

San Francisco, California, 3d.

Alexandria, Dakota, 1st, 2d, 4th, 8th.

Punta Rassa, Florida, 26th.

Augusta, Georgia, 31st.

Morrison, Illinois, 2d, 8th, 13th.

Yates Centre, Kansas, 1st.

Fort Scott, Kansas, 1st.

Lansing, Michigan, 15th.

Saint Vincent, Minnesota, 23d.

Clinton, Missouri, 1st, 11th, 17th, 29th.

Freehold, New Jersey, 31st.

Williamsport, Pennsylvania, 30th.

Strafford, Vermont, 7th.

Franklin, Wisconsin, 8th.

Beloit, Wisconsin, 4th.

EARTHQUAKES.

Nashville, Tennessee, 11th.—A slight shock of earthquake was felt in this city between 1.15 and 1.20 a. m. Many of the inhabitants were awakened from its effects. The shock was also felt at Jackson, Tennessee, (seventy miles southwest of Nashville), and at points in northwestern Tennessee and southern Kentucky. At Clarksville, Tennessee, cooking utensils, toilet articles, etc., were displaced.

Memphis, Tennessee, 11th.—Three distinct shocks of earthquakes were felt in this city at 1.10 a. m., and were accompanied by a vibratory motion.

Cairo, Illinois, 11th.—Heavy shock of earthquake felt at 1.15 a. m., lasting fifteen seconds.

Anna, Illinois, 10th.—A slight shock of earthquake occurred at 2.25 p. m., lasting about ten seconds. At 1.20 a. m. of the 11th, quite a heavy shock was felt, which was preceded by a roaring sound like that of distant train. The shock was of about forty seconds duration; vibration from west to east.

Collinsville, Illinois, 11th.—Slight shock of earthquake felt here at 1.20 a. m.

Paducah, Kentucky, 11th.—A heavy shock of earthquake was felt at this place between midnight and 1.00 a. m.

St. Louis, Missouri, 11th.—Earthquake shock at 1.00 a. m. A gentle, swaying motion was felt, lasting less than one minute, the direction of vibration is not known.

Protem, Missouri, 10th.—Several persons in this and neighboring localities, report having felt a slight earthquake shock about 12 m.

Los Angeles, California, 23d.—Slight shock of earthquake at 5.00 a. m.; vibration from north to south. Two distinct shocks were felt, separated by an interval of about two seconds.

San Francisco, California, 23d.—Very sharp shock of earthquake of short duration, was felt here and in the surrounding country at 11.40 p. m. The direction of vibration was not determined.

Addison, Maine.—1st, Two shocks of earthquake were felt here during the morning; the first shock was felt at 2.58 a. m., and the second at 8.28 a. m.

SAND-STORMS.

Apache Pass, Arizona, 18th.

Yuma, Arizona, 18th.

Visalia, California, 1st.

West Las Animas, Colorado, 7th, 12th, 18th, 29th.

Fort Union, New Mexico, 7th, 29th, 30th, 31st.

El Paso, Texas, 16th, 18th, 19th.

POLAR BANDS.

Punta Rassa, Florida, 3d.

Yates Centre, Kansas, 2d, 24th, 26th, 30th.

Salina, Kansas, 30th.

Protem, Missouri, 17th, 23d.

Freehold, New Jersey, 23d.

Nashville, Tennessee, 14th, 15th, 17th, 31st.

Wytheville, Virginia, 2d, 12th, 14th, 15th, 21st, 22d, 25th, 26th.

Fort Myer, Virginia, 14th.

ZODIACAL LIGHT.

Little Rock, Arkansas, 25th.

New Haven, Connecticut, 31st.

Wicklow, Dakota, 1st to 5th, 8th, 9th, 10th, 15th, 27th, 28th, 30th, 31st.

Punta Rassa, Florida, 4th, 5th, 8th.

Springfield, Illinois, 28th, 30th, 31st.

Wabash, Indiana, 25th.

Clinton, Iowa, 1st, 2d, 3d, 6th, 8th.

Monticello, Iowa, 27th, 30th, 31st.

Yates Centre, Kansas, 9th, 10th.

Clay Centre, Kansas, 7th.

Orono, Maine, 20th.

Cornish, Maine, 2d.

Cambridge, Massachusetts, visible, 1st to 4th, 7th, 26th, 30th, 31st; suspected, 11th, 12th.

Somerset, Massachusetts, 1st, 2d, 3d, 26th, 30th, 31st.

Rowe, Massachusetts, 31st.

Clinton, Missouri, 1st, 9th.

Mountainville, New York, 31st.

Nashville, Tennessee, 9th, 23d, 24th, 26th, 29th.

Chattanooga, Tennessee, 24th.

New Ulm, Texas, 29th.

Palestine, Texas, 6th, 7th, 9th, 11th, 22d to 25th, 29th.

Variety Mills, Virginia, 27th, 29th, 30th.

Franklin, Wisconsin, 25th.

PRAIRIE FIRES.

Fort Supply, Indian Territory, 29th, 30th.

Creswell, Kansas, 9th, 10th, 31st.

Coleman City, Texas, 7th, 24th, 25th, 29th, 30th.

Fort Concho, Texas, 13th, 24th, 30th.

Fort Elliott, Texas, 12th.

Fort McKavett, Texas, 11th, 12th, 14th, 15th, 17th, 18th, 21st to 26th, 30th, 31st.

DROUGHT.

Bangor, Maine, 31st.—A drought of great severity prevails in this state; it is especially severe in this (Penobscot) county. All mills that are run by water-power have suspended operations. Springs and wells are now exhausted that were never before known to fail. Farmers suffer great inconveniences; in consequence of the drought snow is melted, and water is hauled long distances for stock and domestic purposes.

Charlotte, Vermont, 31st.—Great scarcity of water continues; the wells and streams are very low, necessitating farmers to melt snow for their stock.

Dyberry, Pennsylvania, 31st.—Many streams and wells are dry in this locality.

Litchfield, Michigan, 31st.—Springs are very low for this season of the year.

Topeka, Kansas, 20th.—Owing to protracted drought, wells and cisterns in this vicinity are very low.

Westborough, Massachusetts, 31st.—The streams and wells are as low as during the severe drought of one-hundred and fifteen days duration of last summer.

MIGRATION OF BIRDS.

Geese flying southward.—Red Bluff, California, 9th, 10th;

Fort Madison, Iowa, 30th; Muscatine, Iowa, 4th; Newport,

Rhode Island, 9th. *Flying northward.*—Augusta, Georgia,

12th, 13th, 14th; Fort Madison, Iowa, 4th, 13th; Swanwick,

Illinois, 28th. *Flying westward.*—Creswell, Kansas, 24th.

Flying eastward.—Cape Mendocino, California, 21st.

Ducks flying southward.—Erie, Pennsylvania, 10th; Coleman

City, Texas, 7th. *Flying northward.*—Fort Macon, North Carolina, 12th.

NOTES AND EXTRACTS.

The following extract is taken from the "Scientific American" Supplement, No. 370, of February 3, 1883.

SURFACE TEMPERATURES IN PARIS.

Edmond and Henri Becquerel have presented to the French Academy their observations upon the temperatures of the air and earth during the year 1880. They find that at the upper surface of the ground, when covered with snow, the temperature was maintained almost constantly in the neighborhood of -1°C. (30.2°F.), and did not fall below -1.5°C. (29.3°F.), although the temperature of the air, as well as that of the upper surface of the snow, varied from -15°C. (5°F.), to 0°C. (32°F.). The diurnal variations of temperature at the surface of the soil were perceptible under a mass of snow of 0.25 meters thickness (9.84 inches), but they never exceed a few tenths of a degree; moreover, the differences in the observed temperatures at different depths in the snow varied nearly in proportion to the depth. These results show that a bed of snow, when the temperature is below 0°C. (32°F.), has a feeble conductivity, and behaves like a conducting body traversed by a calorific wave. Under a surface which is covered by turf, the variations are much more feeble than under a surface of gravel or loam. The network of rootlets constitutes an almost complete non-conductor. Each bed of soil is submitted to the influence of two calorific effects; one due to the variations of external temperature; the other to the action of the deep layers which tend to produce a constant temperature. The amplitude of thermometric oscillation which results from these complex effects, when there is any disturbing influence, such as an infiltration of water, varies inversely with the depth of the bed.—*Comptes Rendus*.